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Exercise - I (Conceptual Questions) Build Up Your Understanding

PROPERTIES AND COMPOUNDS

1. Correct order of density is –
(1) Li > Na (2) K > Na
(3) Mg > Ca (4) Cs < Rb

2. Which is having highest m.p. –
(1) Be (2) Mg (3) Ca (4) Sr

3. Weak reductant in alkali metal is –
(1) Li (2) Na (3) K (4) Cs

4. The metal used in photoelectric cell is –
(1) Na (2) Cs (3) Mg (4) Ca

5. Lithium chloride is highly soluble in –
(1) C_6H_6 (2) H_2O (3) D_2O (4) All

6. Which metal will not form superoxide –
(1) Li (2) Be (3) Na (4) All

7. More stable hydride is –
(1) Cs – H (2) Rb – H
(3) K – H (4) Li – H

8. In which compound hydrogen is electronegative –
(1) CaH_2 (2) CH_4 (3) HCl (4) All

9. Which of the following metal will give apple green colour on Bunsen flame –
(1) Ba (2) Sr
(3) Ca (4) K

10. The density of –
(1) Na > K (2) Na = K
(3) K > Na (4) Li > K

11. Ionic conductances of hydrated M^+ ions are in the order –
(1) $Li^+(aq) > Na^+(aq) > K^+(aq) > Rb^+(aq) > Cs^+(aq)$
(2) $Li_+(aq) > Na_+(aq) < K_+(aq) < Rb_+(aq) < Cs_+(aq)$
(3) $Li^+(aq) > Na^+(aq) > K^+(aq) > Rb^+(aq) < Cs^+(aq)$
(4) $Li^+(aq) < Na^+(aq) < K^+(aq) < Rb^+(aq) < Cs^+(aq)$

12. Which of the following halides has the highest melting point –
(1) NaCl (2) KCl
(3) NaBr (4) NaF

13. Which of the following does not give an oxide on heating –
(1) $MgCO_3$ (2) Li_2CO_3
(3) $ZnCO_3$ (4) K_2CO_3

14. Molten potassium chloride conducts electricity due to the presence of –
(1) Free electron
(2) Free ions
(3) Free molecules
(4) Atom of potassium & chloride

15. Which of the following element have maximum tendency to form complex compound –
(1) Be (2) Ba (3) Ca (4) Mg

16. On heating sodium metal in the current of dry ammonia leads to the formation of which gas–
(1) $NaNH_2$ (2) NaN_3
(3) NH_3 (4) H_2

17. Sodium reacts with water more vigorously than lithium because it –
(1) Has higher atomic weight
(2) Is more electronegative
(3) Is more electropositve
(4) Is a metal

18. The strongest reducing agent is –
(1) Be (2) Mg (3) Sr (4) Ba

19. Both Be and Al become passive on reaction with conc. nitric acid due to –
(1) The non reactive nature of the metal
(2) The non reactive nature of the acid
(3) The formation of an inert oxide layer on the surface of the metals
(4) None of these

20. Sodium loses its lustre on exposure to moist air due to formation of –
(1) Na_2O, NaOH and Na_2CO_3
(2) Na_2O and NaOH
(3) Na_2O and Na_2CO_3
(4) NaOH and Na_2CO_3

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21. Potassium carbonate when heated to high temperature.
(1) Gives CO_2 (2) Gives O_2
(3) Gives CO (4) Gives no gas at all

22. On Flame test K give _____ colour –
(1) Golden yellow (2) Crimson red
(3) Violet (4) Apple green

23. An element having electronic configuration $1s^2\ 2s^2\ 2p^6\ 3s^2\ 3p^6\ 4s^1$ will form –
(1) Acidic oxide (2) Basic oxide
(3) Amphoteric oxide (4) Neutral oxide

24. Which decomposes on heating –
(1) NaOH (2) KOH
(3) LiOH (4) RbOH

25. Which metal does not form ionic hydride –
(1) Na (2) Rb (3) Ca (4) Be

26. The element of IA group which combines directly with nitrogen is –
(1) Li (2) Na (3) K (4) Cs

27. Which of the following is paramagnetic
(1) K_2O (2) K_2O_2 (3) KO_2 (4) Na_2O

28. A compound which upon hydrolysis releases ammonia is –
(1) Li_3N (2) $LiNO_3$
(3) $NaNO_3$ (4) None of these

29. Which statement will be true for solution, when Ba is dissolved in ammonia:-
(1) Solution becomes blue
(2) Solution becomes good conductor
(3) Solution remains colourless
(4) Both (1) and (2) are correct

30. In K, Rb and Cs, the decreasing order of reducing power in gaseous state is:-
(1) K > Cs > Rb (2) Cs > Rb > K
(3) K < Cs < Rb (4) Rb > Cs > K

31. The correct order of density of following elements is:- (Be, Mg, Ca, Sr)
(1) Be > Mg > Ca > Sr (2) Ca > Mg > Be > Sr
(3) Ca < Mg < Be < Sr (4) Mg < Ca < Sr < Be

32. On addition of metal, colour of liquid NH_3 solutions converts into bronze, the reason is:-
(1) Ammoniated electrones
(2) Metal amide formation
(3) Liberation of NH_3 gas
(4) Cluster formation of metal ions

33. On allowing ammonia solution of s-block metals to stand for a long time, blue colour becomes fade. The reason is:-
(1) Formation of NH_3 gas
(2) Formation of metal amide
(3) Cluster formation of metal ions
(4) Formation of metal nitrate

34. Which of the following s-block element reacts with NaOH to give water soluble complex :-
(1) Al (2) Ca (3) Be (4) Li

35. When Na and Li placed in dry air we get :-
(1) NaOH, Na_2O, Li_2O
(2) Na_2CO_3, Na_2O_2, Li_2O
(3) Na_2O, Li_3N, NH_3
(4) Na_2O, Li_2O, Li_3N

36. Which of the following oxide having O_2^{-2} (peroxide) anion :-
(1) Na_2O (2) BaO_2 (3) RbO_2 (4) KO_2

37. Generally which of the following properties of IA group metals increases as the atomic number rises:
(a) Metallic character (b) Ionic radius
(c) Melting point (d) Reactivity
(e) Ionisation potential
Correct answer is :-
(1) a, b, c (2) a, b, d (3) c, d, e (4) All

38. Which of the following s-block metals do not impart any colour to the flame
(1) Li, Be (2) Cs, Fr
(3) Be, Mg (4) Ba, Ra

39. Which can not be used to generate H_2 :–
(1) Al + NaOH
(2) Zn + NaOH
(3) Mg + NaOH
(4) LiH + H_2O

40. Only those elements of s-block can produce superoxides which have :-
(1) High ionisation energy
(2) High electronegativity
(3) High charge density
(4) Low ionisation potential

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41. Alkali metals dissolve in liquid NH_3 then which of the following observations is not true:
(1) It becomes paramagnetic
(2) Solution turns into blue due to solvated electrons
(3) It becomes diamagnetic
(4) Solution becomes conducting

42. Alkali metals give colour in bunsen flame due to–
(1) Low electronegativity
(2) One e^- in outer most orbit
(3) Smaller atomic radii
(4) Low ionisation energy

43. Which of the following ions forms a hydroxide that is highly soluble in water ?
(1) K^+ (2) Zn^{2+} (3) Ni^{2+} (4) Al^{3+}

44. The plaster of paris is hardened by
(1) Liberating CO_2
(2) Giving out water
(3) Combining with water
(4) Changing into $CaCO_3$

45. Which of the following alkali metal carbonate is the least stable and decomposes readily
(1) Li_2CO_3 (2) Na_2CO_3
(3) K_2CO_3 (4) Cs_2CO_3

46. In the reaction $M + O_2 \longrightarrow MO_2$ (super oxide) the metal is
(1) Li (2) Na (3) K (4) Ba

47. Li does not resemble other alkali metals in following properties
(1) Li_2CO_3 decomposes into oxides while other alkali carbonates are thermally stable
(2) LiCl is predominantly covalent
(3) Li_3N is stable
(4) All

48. Be and Al resemble in
(1) Both become passive on reaction with HNO_3 due to formation of oxide layer
(2) Their chlorides are lewis acids
(3) Hydroxides are soluble in alkali as well as in acid
(4) All

49. Consider the following points
(a) Cs is the strongest reducing agent in IA group element
(b) Be does not form peroxide in II A group elements
(c) The density of potassium is less than sodium
(d) In alkali metals Li, Na, K and Rb, lithium has the minimum value of M.P.
Point out that the statement -
(1) (a) & (b) are correct
(2) (a), (b) & (c) are correct
(3) (b) & (c) are correct
(4) (b), (c) & (d) are correct

50. Mg^{+2} does not form either peroxide or superoxide, because
(1) Mg^{+2} ion is relatively bigger
(2) Mg^{+2} ion is relatively smaller
(3) Mg^{+2} ion is stable
(4) Mg^{+2} ion is unstable

51. Which of the following is true about Alkali metals
(1) All form solid bicarbonates
(2) All form ionic salt like hydride MH
(3) All form superoxide like KO_2
(4) All form nitrides

52. In between the metals A and B both form oxide but only B forms nitride, when both burn in air so A and B are
(1) Cs, K (2) Mg, Ca
(3) Li, Na (4) K, Mg

53. There is loss in weight when mixture of Li_2CO_3 and $Na_2CO_3.10H_2O$ is heated strongly. This loss is due to :
(1) Li_2CO_3
(2) $Na_2CO_3.10H_2O$
(3) both
(4) none

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Note : Q.54 to Q. 57 are based on following reaction(s) :

$A \xrightarrow{\Delta} B\text{ (oxide)} + CO_2$

$B + H_2O \longrightarrow C$

$C + CO_2 \longrightarrow A\text{ (milky)}$

$B + NH_4Cl \xrightarrow{\Delta} D\text{ (gas)}$

$D + H_2O + CO_2 \longrightarrow E$

$E + NaCl \longrightarrow F$

$F \xrightarrow{\Delta} Na_2CO_3 + CO_2 + H_2O$

54. Name of the process is :
(1) solvay (2) ammonia-soda
(3) both correct (4) none is correct

55. A is :
(1) $Ca(HCO_3)_2$ (2) $CaCO_3$
(3) CaO (4) Na_2CO_3

56. B and C are :
(1) CaO, $Ca(OH)_2$ (2) $Ca(OH)_2$, $CaCO_3$
(3) $CaCO_3$, $Ca(OH)_2$ (4) $Ca(OH)_2$, CaO

57. D, E and F are :
(1) NH_3, NH_4Cl, NH_4HCO_3
(2) NH_3, NH_4HCO_3, $NaHCO_3$
(3) NH_4HCO_3, Na_2CO_3, $NaHCO_3$
(4) None

58. A wire of an alkaline earth metal X, burnt in air and dipped in water, a gas 'Y' is evolved X and Y are respectively :–
(1) Na, NO_2 (2) Be, NO_2
(3) Mg, CO_2 (4) Mg, NH_3

59. Ratio of SiO_2 and Al_2O_3 for a good quality cement.
(1) 2.5 – 4.0 (2) 1.5 – 2.5
(3) 3.5 – 5.0 (4) 0.5 – 1.5

60. To obtain pure NaCl final solution is saturated with which of the following gas :
(1) NH_3 (2) N_2 (3) O_2 (4) HCl

61. Solvay process cannot be used for the manufacture of K_2CO_3 since
(1) $KHCO_3$ is having high lattice energy and Less solubility
(2) $KHCO_3$ is having high hydration enthalpy and more solubility
(3) $KHCO_3$ is having high MP
(4) All

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62. $BeO + C + Cl_2 \xrightarrow{\Delta} A + CO$
Correct statement(s) about 'A'
(1) It has sp^2 hybridisation of Be in its polymeric form
(2) It has sp^2 hybridisation in its dimeric form
(3) Its dimeric structure is non planar
(4) It has $3C–2e^-$ bond in its polymeric structure

63. Solubility of carbonate, sulphates, hydroxides of alkaline earth metals going top to bottom has an order
(1) increase, increase, increase
(2) decrease, increase, increase
(3) decrease, decrease, increase
(4) decrease, decrease, decrease

64. Lime water turns milky by the passage of CO_2 and milkyness disappears when excess of CO_2 is passed Compounds responsible for these processes are :
(1) $Ca(HCO_3)_2$, $CaCO_3$
(2) $CaCO_3$, $Ca(HCO_3)_2$
(3) $CaCO_3$, CaO
(4) $Ca(OH)_2$, $Ca(HCO_3)_2$

65. Gypsum $\xrightarrow{393K}$ [A] $\xrightarrow{>393K}$ [B] Formula of A and B respectively
(1) $CaSO_4$ $2(CaSO_4).H_2O$
(2) $CaSO_4.2H_2O$ $2(CaSO_4).H_2O$
(3) $2(CaSO_4).H_2O$ $CaSO_4$
(4) $CaSO_4$ $CaSO_4.\frac{1}{2}H_2O$

66. Sodium metal can be used for the drying of
(1) Ethanol (2) Phenol
(3) Ammonia (4) Dimethyl ether

67. Which of the metal is used with aluminium to form air craft parts.
(1) K (2) Li
(3) Na (4) None

68. Which of the following used as a important constituent of glass industry.
(1) $LiCO_3$ (2) Na_2CO_3
(3) $MgCO_3$ (4) None

69. Which metal maintain ion balance and nerve impulse conduction in human body
(1) Na (2) K
(3) Both 1 and 2 (4) None

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70. _____ is used in manufacturing of artificial silk.
(1) NaOH (2) RbOH
(3) KOH (4) LiOH

71. Which substance is used for making window of x-ray tubes.
(1) Beryllium (2) Strontium
(3) Barium (4) Radium

72. Substance used in purification of sugar :
(1) $Ca(OH)_2$ (2) BeO
(3) $BeCl_2$ (4) CaO

73. Select the correct statement regarding s-block element's –
(1) They are all are reactive metal with low ionisation energies
(2) The metallic charcter increases down the group
(3) They are never found pure in nature
(4) All of these

74. Correct order of melting point is ?
(1) Be > Ca > Sr > Ba > Mg
(2) Ba > Sr > Ca > Mg > Be
(3) Be > Mg > Ca > Sr > Ba
(4) Be > Sr > Ca > Ba > Mg

75. Indian salt peter is :-
(1) KNO_3 (2) $LiNO_3$ (3) $NaNO_3$ (4) None

EXERCISE-I (Conceptual Questions) ANSWER KEY

Question	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Answer	3	1	2	2	1	4	4	1	1	1	4	4	4	2	1
Question	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
Answer	4	3	4	3	1	4	3	2	3	4	1	3	1	4	2
Question	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45
Answer	3	4	2	3	4	2	2	3	3	4	3	4	1	3	1
Question	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60
Answer	3	4	4	3	2	2	4	3	3	2	1	2	4	1	4
Question	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75
Answer	2	2	3	2	3	4	2	2	3	1	1	4	4	1	1

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Exercise - II (Previous Year Questions) AIPMT/NEET

AIPMT-2010

1. Compound A on heating gives a colourless gas and a residue that is dissolved in water to obtain B. Excess of CO_2 is bubbled through aqueous solution of B, C is formed which is recovered in the solid form. Solid C on gentle heating gives back A. The compound is :-

(1) Na_2CO_3 (2) K_2CO_3

(3) $CaSO_4.2H_2O$ (4) $CaCO_3$

AIPMT Mains-2011

2. Which of the following statements is incorrect :-

(1) $NaHCO_3$ on heating gives Na_2CO_3

(2) Pure sodium metal dissolves in liquid ammonia to give blue solution

(3) NaOH reacts with glass to give sodium silicate

(4) Aluminium reacts with excess NaOH to give $Al(OH)_3$

NEET-II 2016

3. The suspension of slaked lime in water is known as

(1) milk of lime

(2) aqueous solution of slaked lime

(3) limewater

(4) quicklime

4. In context with beryllium, which one of the following statements is **incorrect** ?

(1) Its salts rarely hydrolyze.

(2) Its hydride is electron-deficient and polymeric.

(3) It is rendered passive by nitric acid.

(4) it forms Be_2C.

NEET(UG) 2019 (ODISHA)

5. Crude sodium chloride obtained by crystallisation of brine solution does not contain

(1) $MgSO_4$ (2) Na_2SO_4

(3) $MgCl_2$ (4) $CaSO_4$

6. Which of the alkali metal chloride (MCl) forms its dihyrate salt ($MCl.2H_2O$) easily ?

(1) LiCl (2) CsCl (3) RbCl (4) KCl

NEET(UG) 2020

7. HCl was passed through a solution of $CaCl_2$, $MgCl_2$ and NaCl. Which of the following compound(s) crystallise(s) ?

(1) NaCl, $MgCl_2$ and $CaCl_2$

(2) Both $MgCl_2$ and $CaCl_2$

(3) Only NaCl

(4) Only $MgCl_2$

8. The following metal ion activates many enzymes, participates in the oxidation of glucose to produdce ATP and with Na, is responsible for the transmission of nerve signals.

(1) Potassium (2) Iron

(3) Copper (4) Calcium

NEET(UG) 2020(COVID-19)

9. Identify the correct statement from the following.

(1) The order of hydration enthalpies of alkaline earth cations

$Be^{2+} < Mg^{2+} < Ca^{2+} < Sr^{2+} < Ba^{2+}$

(2) Lithium and Magnesium show some similarities in their physical properties as they are diagonally placed in periodic table.

(3) Lithium is softer among all alkali metals.

(4) Lithium chloride is deliquescent and crystallises as a hydrate, $LiCl \cdot H_2O$.

10. What is the role of gypsum, $CaSO_4.2H_2O$ in setting of cement ? Identify the correct option from the following :

(1) to fasten the setting process

(2) to provide water molecules for hydration process

(3) to help to remove water molecules

(4) to slow down the setting process

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NEET(UG) 2021

11. Among the following alkaline earth metal halides, one which is covalent and soluble in organic solvents is:
(1) Calcium chloride
(2) Strontium chloride
(3) Magnesium chloride
(4) Beryllium chloride

12. The structures of beryllium chloride in solid state and vapour phase, are:
(1) Chain and dimer, respectively
(2) Linear in both
(3) Dimer and Linear, respectively
(4) Chain in both

NEET(UG) 2022

13. Identify the incorrect statement from the following
(1) The oxidation number of K in KO_2 is + 4.
(2) Ionisation enthalpy of alkali metals decreases from top to bottom in the group.
(3) Lithium is the strongest reducing agent among the alkali metals.
(4) Alkali metals react with water to form their hydroxides.

14. Match List-I with List-II.

List-I		List-II	
(a)	Li	(i)	absorbent for carbon dioxide
(b)	Na	(ii)	electrochemical cells
(c)	KOH	(iii)	coolant in fast breeder reactors
(d)	Cs	(iv)	photoelectric cell

Choose the correct answer from the options given below :
(1) (a)-(iii), (b)-(iv), (c)-(ii), (d)-(i)
(2) (a)-(i), (b)-(iii), (c)-(iv), (d)-(ii)
(3) (a)-(ii), (b)-(iii), (c)-(i), (d)-(iv)
(4) (a)-(iv), (b)-(i), (c)-(iii), (d)-(ii)

15. $CaCl_2$ and $Ca(OCl)_2$ are components of :
(1) gypsum
(2) Portland cement
(3) bleaching powder
(4) lime water

EXERCISE-II (Previous Year Questions) ANSWER KEY

Question	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Answer	4	4	1	1	1	1	3	1	2	4	4	1	1	3	3

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Exercise – III (Analytical Questions) Master Your Understanding

1. Given below are two statements :

Statement-I : Except beryllium fluoride all the other fluoride of alkaline earth metals are ionic in nature.

Statement-II : Beryllium halides are essentially covalent and soluble in organic solvent.

In the light of the above statements, choose the **most appropriate** answer from the options given below :

(1) Statement I & II both are correct.
(2) Statement I is correct but II is incorrect.
(3) Statement I is incorrect but II is correct
(4) Both statement I & II are incorrect.

2. Given below are two statements :

Statement-I : Solubility of carbonates of alkali metals increases on moving down the group. While decrease of alkaline earth metals carbonates and sulphates.

Statement-II : The ionic radius of $K^{\oplus}$ is greater than all the alkaline earth metal ions.

In the light of the above statements, choose the **most appropriate** answer from the options given below :

(1) Statement I & II both are correct.
(2) Statement I is correct but II is incorrect.
(3) Statement I is incorrect but II is correct
(4) Both statement I & II are incorrect.

3. Given below are two statements :

Statement-I : the dilute solution of alkalimetals in liquid ammonia is paramagnetic and dark blue in colour.

Statement-II : On increasing the concentration of alkalimetal in liquid ammonia, blue colour is finally converted into bronze and solution becomes paramagnetic in nature.

In the light of the above statements, choose the **most appropriate** answer from the options given below :

(1) Statement I & II both are correct.
(2) Statement I is correct but II is incorrect.
(3) Statement I is incorrect but II is correct
(4) Both statement I & II are incorrect.

4. Given below are two statements :

Statement-I : KO_2 is coloured and paramagnetic compound.

Statement-II : O_2^- has one unpaired electron in KO_2.

In the light of the above statements, choose the **most appropriate** answer from the options given below :

(1) Statement I & II both are correct.
(2) Statement I is correct but II is incorrect.
(3) Statement I is incorrect but II is correct
(4) Both statement I & II are incorrect.

5. Given below are two statements :

Statement-I : LiCl is deliquescent and crystallises as a hydrate $LiCl.6H_2O$.

Statement-II : The ionic potential of Li^+ ion is highest among all the alkali metal ions.

In the light of the above statements, choose the **most appropriate** answer from the options given below :

(1) Statement I & II both are correct.
(2) Statement I is correct but II is incorrect.
(3) Statement I is incorrect but II is correct
(4) Both statement I & II are incorrect.

6. Given below are two statements :

Statement-I : LiF is much more soluble in water with in their group fluoride.

Statement-II : Li_2CO_3 does not decompose easily on heating.

In the light of the above statements, choose the **most appropriate** answer from the options given below :

(1) Statement I & II both are correct.
(2) Statement I is correct but II is incorrect.
(3) Statement I is incorrect but II is correct
(4) Both statement I & II are incorrect.

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7. Given below are two statements; one is labelled as **Assertion (A)** and the other is labelled as **Reason(R)** .

Assertion : The carbonate of lithium decomposes easily on heating to form lithium oxide and CO_2.

Reason : Lithium being very small in size polarises large carbonate ion leading the formation of more stable Li_2O and CO_2.

In the light of the above statements, choose the **most appropriate** answer from the options given below :

(1) If (A) & (R) both are correct and (R) is the correct explanation of (A).

(2) If (A) & (R) both are correct but (R) is not correct explanation of (A).

(3) If (A) is correct but (R) is incorrect.

(4) (A) & (R) both are incorrect.

8. Given below are two statements; one is labelled as **Assertion (A)** and the other is labelled as **Reason(R)** .

Assertion : $BeSO_4$ & $MgSO_4$ are readily soluble in water.

Reason : Greater values of hydration enthalpies of Be^{+2} and Mg^{+2} ions overcome the lattice enthalpy factor.

In the light of the above statements, choose the **most appropriate** answer from the options given below :

(1) If (A) & (R) both are correct and (R) is the correct explanation of (A).

(2) If (A) & (R) both are correct but (R) is not correct explanation of (A).

(3) If (A) is correct but (R) is incorrect.

(4) (A) & (R) both are incorrect.

9. Given below are two statements; one is labelled as **Assertion (A)** and the other is labelled as **Reason(R)**.

Assertion : The enthalpy of formation (ΔH_f) of fluoride of alkali metals become more negative as we go down the group.

Reason : The lattice energy of M^+F^- increases on moving down the group.

In the light of the above statements, choose the **most appropriate** answer from the options given below :

(1) If (A) & (R) both are correct and (R) is the correct explanation of (A).

(2) If (A) & (R) both are correct but (R) is not correct explanation of (A).

(3) If (A) is correct but (R) is incorrect.

(4) (A) & (R) both are incorrect.

10. Given below are two statements; one is labelled as **Assertion (A)** and the other is labelled as **Reason(R)** .

Assertion : The ammonia soda process is used to produced Na_2CO_3 synthetically but K_2CO_3 can not be produced.

Reason : $KHCO_3$ is highly soluble in water than $NaHCO_3$.

In the light of the above statements, choose the **most appropriate** answer from the options given below :

(1) If (A) & (R) both are correct and (R) is the correct explanation of (A).

(2) If (A) & (R) both are correct but (R) is not correct explanation of (A).

(3) If (A) is correct but (R) is incorrect.

(4) (A) & (R) both are incorrect.

11. Match the column :-

Column-I		**Column-II**	
(a)	$Na_2CO_3.10H_2O$	(p)	Used in space & submarine
(b)	CaO	(q)	Used in fire extinguishers
(c)	$NaHCO_3$	(r)	Used in petroleum refining
(d)	Na_2O_2 or KO_2	(s)	used in water softening

(1) a – r, b – s, c –p, d – q

(2) a – q, b – s, c – p, d – r

(3) a – s, b – r, c – q, d – p

(4) a – s, b – r, c – p, d – q

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12. Match the column :-

Column-I (Element)		Column-II (Flame colour)	
(a)	Li	(p)	Golden yellow
(b)	Na	(q)	Crimson red
(c)	K	(r)	Violet
(d)	Rb	(s)	Red violet

(1) a – p, b – q, c – s, d – r
(2) a – q, b – p, c – r, d – s
(3) a – s, b – r, c – s, d – p
(4) a – q, b – p, c – s, d – r

13. Match the column :-

Column-I (Compound)		Column-II (Process of formation)	
(a)	$Na_2CO_3.10H_2O$	(p)	Castner-Kellner process
(b)	NaOH	(q)	Solvey process
(c)	$CaSO_4.\frac{1}{2}H_2O$ (Properlike)	(r)	Formed by heating of zypsum
(d)	$CaOCl_2$	(s)	Formed by the reaction of $Ca(OH)_2$ withCl_2

(1) a – q, b – p, c – s, d – r
(2) a – p, b – q, c – s, d – r
(3) a – q, b – p, c – r, d – s
(4) a – p, b – q, c – r, d – s

14. Match the column :-

Column-I (Alloy)		Column-II (Uses)	
(a)	Li – Pb	(p)	as a coolant in fast breeder nuclear reactor.
(b)	Li – Al	(q)	bearing for motor engines
(c)	Li – Mg	(r)	Aircraft parts
(d)	Liquid Na	(s)	Armor part

(1) a – q, b – p, c – r, d – s
(2) a – p, b – q, c – s, d – r
(3) a – q, b – r, c – s, d – p
(4) a – p, b – q, c – r, d – s

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15. Match the column :-

Column-I (Element)		Column-II (Propertics)	
(a)	Li	(p)	Most negative E° value
(b)	Na	(q)	Soluble sulphate
(c)	Be	(r)	Least negative E° value among all alkalimetals
(d)	Ba	(s)	$6s^2$ outer electronic configuration

(1) a – q, b – p, c – r, d – s
(2) a – p, b – q, c – s, d – r
(3) a – s, b – p, c – q, d – r
(4) a – p, b – r, c – q, d – s

16. NaCl imparts of golden yellow colour to the Barnes flame. this is due to:-
(A) Photosensitivity of sodium
(B) Low I.p. of sodium
(C) Sublimation of metallic sodium to give yellow vapour.
(D) Emission of excess energy absorbed as a radiation in the visible region.
(1) If (A), (B) and (C) options are correct.
(2) If (A) and (B) both options are correct.
(3) If (B) and (D) both options are correct.
(4) If (A) and (C) both options are correct.

17. The pair of compound that cannot exist together in aqueous solution:-
(A) $NaHCO_3$ + NaOH
(B) NaH_2PO_4 + NaOH
(C) Na_2CO_3 + NaOH
(D) NaH_2PO_2 + Na_2HPO_4
(1) If (A), (B) and (C) options are correct.
(2) If (A) and (B) both options are correct.
(3) If (B) and (D) both options are correct.
(4) If (A) and (C) both options are correct.

18. Which of the following compound does not conduct electricity in molten state :-
(A) $BeCl_2$ (B) BeF_2 (C) $BaCl_2$ (D) CaF_2
(1) If (A), (B) and (C) options are correct.
(2) If (A) and (B) both options are correct.
(3) If (B) and (D) both options are correct.
(4) If (A) and (C) both options are correct.

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19. The metal which from nitride on reaction with N_2 :-
(A) Li (B) Al (C) Mg (D) Na
(1) If (A), (B) and (C) options are correct.
(2) If (A) and (B) both options are correct.
(3) If (B) and (D) both options are correct.
(4) If (A) and (C) both options are correct.

20. Alkali metals are characterised by :-
(A) Good conductor of heat & electricity
(B) High oxidation potential
(C) Solubility in liquid NH_3
(D) High melting point.
(1) If (A), (B) and (C) options are correct.
(2) If (A) and (B) both options are correct.
(3) If (B) and (D) both options are correct.
(4) If (A) and (C) both options are correct.

EXERCISE-III (Analytical Questions) ANSWER KEY

Question	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Answer	**1**	**1**	**2**	**1**	**3**	**4**	**1**	**1**	**4**	**1**	**3**	**2**	**3**	**3**	**4**
Question	16	17	18	19	20										
Answer	**3**	**2**	**2**	**1**	**1**										

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Important Notes